

IV. Environmentally Preferred Alternative

The environmentally preferred alternative is Alternative 6. Of the alternatives that address the Purpose and Need for the proposal (either fully or partially), this is the alternative that causes the least damage to the biological and physical environment. See Table 3 for a summary of environmental impacts.

V. Decision and Basis

The alternative selected for this project is Alternative 6. Alternative 6 includes a combination of rehabilitation, light reconstruction, and full reconstruction with three types of surfacing depending on location. The three types of surfacing include asphalt with chip seal, gravel with magnesium chloride, and macadam.

Alternative 6 has been selected because it best balances the transportation and maintenance needs with the sensitive nature of the environment. Although another alternative may more fully address one or more of the individual project objectives listed in Table 1, this is generally at the expense of another objective. Alternative 6 provides the best overall balance of any of the alternatives by ensuring that each objective is at least partially addressed to a minimum level of satisfaction.

For each project need, the following is a discussion of the basis for selection of Alternative 6.

Project Objective I. Provide a Roadway Width and Surface Capable of Accommodating Anticipated 2025 Traffic Volumes: In its current condition, Guanella Pass Road does not safely accommodate current traffic volumes and types. The anticipated increase in year 2025 traffic volumes over the 1995 volumes for Guanella Pass Road range from a 56 percent increase for Alternative 1 to between 88 and 183 percent depending on the build alternative.

As a result, with a projected increase of 56 percent increase by 2025, Alternative 1 would not accommodate these anticipated volumes. Improvements proposed for Alternatives 2 through 5 are based on minimum design standards for a rural collector road, and include a roadway width of 24 feet. Alternatives 2 and 3 are expected to fully accommodate the projected year 2025 traffic volumes and vehicle types anticipated for these alternatives. Only the sections of Alternatives 4 and 5 that are proposed for reconstruction are expected to accommodate projected year 2025 traffic volumes and vehicle types. The unimproved sections in Alternative 4 (49 percent) and the rehabilitation sections of Alternative 5 (49 percent) would not accommodate such volumes and traffic types.

Alternative 6 is based on minimum design standards for a rural local road, and includes a roadway width of 22 feet, and shorter design vehicle, and other features more suitable to a road that is intended primarily to provide access to lands adjacent to the road. Although rehabilitation is proposed for 63 percent of Alternative 6, it will be able to meet this project objective at least as well as Alternatives 4 or 5 because the projected year 2025 traffic volumes for Alternative 6 are expected to be the least of all the build alternatives. While the design of the roadway and adjacent facilities is expected to help regulate traffic volumes and vehicle size, the cooperation of the FS, Clear Creek County, Park County, and the Town of Georgetown may also be needed to manage the vehicle size allowed on Guanella Pass road, restrict commercial truck traffic, and

manage the corridor land use in conformance with the rural local road classification and design of Alternative 6.

Project Objective II. Improve Safety by Providing Consistent Roadway Geometry and Providing Reasonable Protection from Unsafe Conditions: Alternative 1 perpetuates the existing safety hazards associated with poor sight-distance and roadway geometry, and varying roadway width. All five of the build alternatives will address this need, though to varying degrees.

Alternatives 2 and 3 address this need to the greatest extent by reconstructing the entire length of the road, widening the road to a consistent width of 24 feet and employing consistent design geometry, improving sight-distance, eliminating or reducing ice flows and other problems related to poor drainage, installing guardrail, and providing vehicle pullouts. Alternatives 4 and 5 would be less effective at meeting this objective. Alternatives 4 and 5 would reconstruct 51 percent of the road to the same standards as that of Alternatives 2 and 3. The remaining 49 percent would either remain unchanged (Alternative 4) or be rehabilitated to the existing width (Alternative 5). In these sections safety hazards associated with poor sight-distance, roadway geometry, and varying roadway width would remain. Alternative 6 will partially improve the safety of the roadway.

Alternative 6 will meet this objective better than Alternatives 4 or 5 because it will provide a consistent roadway width of 22 feet. The reconstruction sections (18 percent light and 19 percent full reconstruction) will provide consistent geometry, improved sight distances, and fully address drainage problems. The rehabilitation sections (63 percent of the road) in Alternative 6 will partially address the drainage and ice flow problems and, where possible, safety concerns related to poor sight distance, roadway geometry, and roadside hazards.

Project Objective III. Accommodate and Control Access to Forest Service Facilities Located along the Road: Alternative 1 would not improve or better control access to FS facilities. Alternatives 2, 3, 5, and 6, and the build sections of Alternative 4 all would accommodate and control access to the FS facilities located along the road. Parking areas would be formalized, and parking and dispersed camping outside of designated areas will be discouraged with earthwork grading, boulder placement, guardrails, signs, and other techniques. The no action portions (49 percent) of Alternative 4 would not address this project objective.

Project Objective IV. Reduce the Anticipated Maintenance Costs to the Counties and Town Maintaining the Road: Alternative 1 will require the Counties to spend an increasing amount of time and money for maintenance as traffic volumes increase and the roadway continues to age. All five of the build alternatives would reduce anticipated maintenance from what is expected if nothing is done to the road. The degree to which each alternative would reduce maintenance effort depends on the amount of reconstruction and pavement included in that alternative. As the amount of asphalt pavement and full reconstruction increases, the projected cost of maintenance over the next twenty years decreases. Alternative 2 would have the least projected maintenance costs, followed by (in order) Alternatives 5 and 6, Alternative 4, Alternative 3, and Alternative 1.

Project Objective V. Repair Roadway Drainage Problems: Under Alternative 1, no drainage repairs would be made, except through maintenance practices by the Counties. Alternatives 2

Table 3 Summary of Environmental Impacts						
	Alternative 1 (No-Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Selected Alternative)
Amount of Reconstruction, Rehabilitation, and Paving	0% reconstruction 0% rehabilitation 48% paved 52% dirt/gravel	100% full reconstruction 0% rehabilitation 100% paved 0% gravel	100% full reconstruction 0% rehabilitation 48% paved 52% gravel	51% full reconstruction 0% rehabilitation 86% paved 14% dirt/gravel	51% full reconstruction 49% rehabilitation 86% paved 14% gravel	37% reconstruction (18% light, 19% full) 63% rehabilitation 56% paved, 14% gravel 30% alternative surface type (macadam preferred)
1. Social Environment						
Community Character	Anticipated change in community character directly proportional to the increase in traffic volume. Traffic will increase with or without the road project, although traffic will increase more under the build alternatives. See Traffic Volume section below.					
Roadway Width (includes travel lanes and shoulders)	5.5-7.2 meters (18-24 feet)	7.2 meters (24 feet)	7.2 meters (24 feet)	Reconstructed areas: 7.2 meters (24 feet) No-Action Areas: 5.5-7.2 meters (18-24 feet)	Reconstructed areas: 7.2 meters (24 feet) Rehabilitated Areas: At least 7.2 meters (24 feet)	6.6 meters (22 feet)
Traffic Volume	56% increase over 1995 traffic volume at the summit in 2025.	40-80% increase over year 2025 No-Action traffic volumes at the summit.	35% increase over year 2025 No-Action traffic volumes at the summit.	40-80% increase over year 2025 No-Action traffic volumes at the summit.	40-80% increase over year 2025 No-Action traffic volumes at the summit.	20% increase over year 2025 No-Action traffic volumes at the summit.
Population and Demographics	No impact anticipated for any of the alternatives.					
Local Economy	Potential enhancements to the local economies such as increased taxable retail sales, increased employment, expanded recreational services, and more year-round visitor activity. Enhancement proportional to increase in traffic volume. See Traffic Volume section above.					
Land Use and Consistency with Local Plans	No impact.	An increase in demand for services such as food and gas is expected, and may lead to changes in land use development. Improved access to private land resulting from alternatives may encourage development.				Residential and commercial land use development and local plan management will need to be monitored by the local agencies to maintain the road’s functional classification as a rural local road.
Cultural Resources	No impact.	No direct impacts to the cultural resources are anticipated for any build alternative. Adverse effect to the visual quality of the Georgetown-Silver Plume National Historic Landmark District (GSPNHLD).				No direct impacts to the cultural resources are anticipated for any build alternative. Alternative 6 will have an adverse effect on the visual quality of the GSPNHLD. However, the impact is to a lesser extent than Alternatives 2-5, because Alternative 6 consists of a narrower roadway width.
Traditional Cultural Properties	No impact anticipated.					
2. Water Resources						
Water Quality	Continued sedimentation impact to existing water resources.	Will improve existing conditions that degrade water quality, such as eroding roadway ditches, shoulders, and embankments. Impacts to water quality are proportional to the amount of hardened surfacing, opportunity to correct existing erosion problems, and potential erosion from new disturbance. Alternative 2 provides the most effective remedy of the build alternatives, followed by Alternative 6 and then by Alternatives 5, 4, then 3. See FEIS Table III-9 – Comparison of Alternatives by Water Quality-Related Roadway Characteristics for more information on water quality related characteristics.				
Wetland and Riparian	Continued sedimentation impact to existing wetlands.	Drainage improvements to the roadway are expected to enhance wetland areas by controlling sedimentation, runoff, and erosion potential. The amount of positive impact is proportional to the amount of sediment reduction as described above.				
Total Direct Wetland Impact hectares (acres)	Not quantified, but continued impacts occur due to sedimentation and maintenance activities on gravel portions of road.	2.96 (7.32)	2.96 (7.32)	0.76 (1.87)	0.76 (1.87)	0.28 (0.71)

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3. Visual Quality						
Visual	No change from the existing visual character. Dusty conditions along the gravel sections continue to lower the visual quality. Unvegetated slopes are not repaired.	Changes to visual character are proportional to the amount of widening and the amount of reconstruction. See the Amount of Reconstruction, Rehabilitation, and Paving section above. Changes to visual character expected from the minor realignments for all build alternatives. The changes in visual character are related to the view from the road for the driver and also the view of the road. Retaining walls used to stabilize slopes for Alternatives 2-5 will detract from the visual quality of the roadway.			The amount of roadway widening under Alternative 6 is less than Alternatives 2-5. The narrower roadway width for Alternative 6 reduces the amount of retaining wall needed, and therefore reduces the impact of retaining wall on the visual character of the road. The reclassification of the road to a rural local road, the lower design speed, and the new design vehicle allow Alternative 6 to more closely follow the existing alignment. These design changes allow Alternative 6 to maintain more of the existing rustic character of the road. The visual impact from the minor realignments is less for Alternative 6 because of the reduced cross section. Alternative 6 provides the greatest amount of rehabilitation of the build alternatives and better maintains the character of the road.	
		Unvegetated slopes are repaired, enhancing the visual quality of the roadway corridor. High traffic volumes on gravel roads result in very dusty conditions, thus lowering the visual quality along the roadway. The extent to which dust becomes a factor is dependent on the amount of reconstruction, rehabilitation, and paving, and the increase in traffic for each alternative. Alternative surface types for gravel sections of the road will help to reduce air-borne dust and retain some of the rustic character of the road. In addition, a coarse chip seal will be used to give the paved sections a more rustic character. See FEIS Chapter II.B.6a: Surfacing Options for more information. Retaining wall, slope treatment, and guardrail designs will be incorporated into all build alternatives with the intent of maintaining the rustic character of the roadway. See FEIS Chapter II.G.1: Retaining Wall Design and Slope Treatments and II.G.3: Guardrail Design and Materials for more information.				
4. Recreational Resources						
Recreational Activities	Recreational use is expected to increase proportional to the increase in traffic volume. See Traffic Volume section above. Increased recreational use creates more pressure for dispersed use of the forests. A detrimental impact on the recreational experience for some users may occur as a result of more users. Increased recreational use increases the need for parking in Georgetown and along the road.					
Pedestrian and Bicyclists	No changes made to improve the existing conditions. Dust, narrow road width, poor sight distance, and increasing traffic will continue to adversely affect pedestrians and bicyclists.	Improved sight distance and additional roadway width along the reconstructed sections of the road improves safety for pedestrians and bicyclists. Dust reduction is directly proportional to the increased length of paved sections. Pedestrians and bicyclists may be negatively impacted due to the increase in traffic volumes for each alternative. See Traffic Volume section above.			Alternative 6 traffic volumes will be less than Alternatives 2-5. See Traffic Volume section above. The roadway width is narrower than Alternatives 2-5, and this may make it more difficult to share the road with pedestrians and bicyclists. Dust levels will remain high on the gravel portions of the roadway, but this can be reduced by dust suppressants.	
5. Plants and Animals						
Wildlife – Direct Effects (proportional to habitat loss)	No impact.	Full reconstruction alternatives would have the most impact.		Alternatives 4 and 5 have about half as much reconstruction as, and therefore less impact than, Alternatives 2 and 3.		Alternative 6 has less reconstruction than Alternatives 2-5, and therefore the least amount of impact.
Wildlife – Indirect Effects (proportional to traffic volume and speed)	Least impact.	Most impact.	Less effect than Alternatives 2, 4, or 5.	Impact similar to Alternative 2.		Less impact than Alternatives 2-5 due to lower traffic volume and lower speed, and therefore the least amount of impact.
Total Boreal Toad Habitat Disturbance hectares (acres)	0 (0)	3.98 (9.7)	3.98 (9.7)	2.13 (5.22)	2.13 (5.22)	1.70 (4.18)
Canada Lynx Impacts	Least impact.	Most impact.	Less effect than Alternatives 2, 4, or 5.	Impact similar to Alternative 2.		May affect, likely to adversely affect. Less impact than Alternatives 2-5 due to lower traffic volume and lower speed, and therefore the least amount of impact. The USFWS does not anticipate that Alternative 6 will result in mortality of individual lynx; however, it may result in the non-lethal take of one lynx.

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Fish Habitat	No changes made to improve the existing conditions. Sedimentation problems continue.	Drainage improvements will greatly reduce sedimentation problems. Fish habitats are likely to improve after construction. However, pre-existing water quality issues will continue to pose a threat to the fish habitats. With the installation of natural bottom culverts, fish passage will improve after construction. Alternative 2 provides the most effective solution to improving the existing conditions, followed by Alternative 6 and then by Alternatives 5, 4, and 3. The impacts to fish habitat are proportional to the amount of hardened surfacing, opportunity to correct existing erosion problem areas, and potential erosion from new disturbance.				
6. Construction Impacts						
General Construction	Maintaining agencies will have to perform construction and/or repair activities above and beyond normal maintenance periodically as the road continues to deteriorate.	Construction impacts such as increased traffic delays, construction noise, and habitat disruption are the same for Alternatives 2 and 3. Construction impacts are less for Alternative 5 and Alternative 4 due to the decreased amount of reconstruction associated with these alternatives. Alternative 6 has the least impact because it has the least reconstruction. Haul loads through the project area are proportional to the amount of reconstruction proposed for each of the build alternatives. Road damage along haul routes is expected for all of the build alternatives. Traffic delays are expected for each of the build alternatives.				
Construction Cost (2002 dollars)	\$0 (Does not include County construction costs to maintain the road as it continues to deteriorate.)	\$46.1 million	\$44.6 million	\$29.2 million	\$35.9 million	\$28.9 million
7. Other Resources						
Air Quality	No change from the existing air quality conditions. Dust in gravel sections continues to impact air quality.	Dust is reduced directly proportional to the increased length of hardened surfacing (pavement or macadam), improving the air quality. See Amount of Reconstruction, Rehabilitation, and Paving section above. The greatest improvement is seen under Alternative 2, followed by Alternatives 4, 5, and 6. No long-term improvements are seen under Alternative 3. Dust suppressants will help to decrease the air-borne dust problem on the gravel road sections of Alternatives 3-6.				
Noise (at projected year 2025 traffic volumes)	No residential noise impacts requiring noise abatement are expected. The decibel increase is associated with future projected traffic.					
	0-3 dB(A) increase over existing levels at 60 m (200 ft) from road.	3-5 dB(A) increase over existing levels at 60 m (200 ft) from road.	1-3 dB(A) increase over existing levels at 60 m (200 ft) from road.	3-5 dB(A) increase over existing levels at 60 m (200 ft) from road.	3-5 dB(A) increase over existing levels at 60 m (200 ft) from road.	1-3 dB(A) increase over existing levels at 60 m (200 ft) from road.
Hazardous Material	No impact.	Disturbance to hazardous material sites 3, 7-9, 12, and 13. Potential impacts to Equator tunnel and Silverdale/Ocean Wave tunnel. See FEIS Chapter III.C.3: Hazardous Materials for more detail.		Disturbance to hazardous material sites 12 and 13. See FEIS Chapter III.C.3: Hazardous Materials for more detail.	Disturbance to hazardous material sites 7-9, 12, and 13. See FEIS Chapter III.C.3: Hazardous Materials for more detail.	
Section 4(f) Impacts Hectares (acres)	0 (0)	0.13 (0.33)	0.13 (0.33)	0.01 (0.03)	0.03 (0.07)	0.03 (0.07)
Utilities	No impact.	Power poles and underground telephone lines would need to be moved under all build alternatives.				
Floodplain	No further impacts over current conditions anticipated.					
Farmlands	No impact anticipated.					
Environmental Justice	No impact anticipated.					
Services	The demand for local services, including police, fire, ambulance, search and rescue, and trash removal, is expected to increase proportional to the increase in traffic volume for each alternative.					
Relocation	No impact anticipated.					
Maintenance Cost (estimated over 20 years)	\$9.3 million	\$4.8 million	\$7.5 million	\$6.6 million	\$5.9 million	\$6.0 million
Secondary Impacts	Increased traffic will create a demand for commercial services such as restaurants, shopping, and gasoline, as well as for community services such as public restrooms and trash removal. The demand for parking in Georgetown will increase directly proportional to increased traffic volumes. The increased use of the road may reduce the perception of the corridor as a tranquil environment as private landowners develop properties for recreational or other uses.					

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and 3, which involve reconstruction for the entire length of the road, would fully address existing drainage problems with the reconstruction of ditches and the installation of additional culverts. Alternative 4 would address drainage problems along only those portions proposed for reconstruction; drainage problems along the no action portions would remain. Alternatives 5 and 6 would address drainage problems along the entire length of the road. However, in the rehabilitation segments (49 percent for Alternative 5 and 63 percent for Alternative 6), drainage repairs would be more limited than under Alternatives 2 or 3 because the roadside ditches will not be widened in the rehabilitation areas.

Project Objective VI. Repair Existing Unvegetated Slopes: The original construction of the road left a number of steep barren slopes that are eroding and contributing to stream sedimentation, and affecting the visual quality of the area.

Alternative 1 would not repair any of the existing unvegetated slopes. Alternatives 2 and 3, which involve full reconstruction, would rebuild all existing barren slopes within the project limits and contour the slopes to promote revegetation. Alternative 4 would repair existing unvegetated slopes only in those sections proposed for reconstruction (51 percent of the route). Alternatives 5 and 6 each contain sections of rehabilitation, where revegetation efforts are limited to work that can be done without reconstructing the slope. This amounts to 49 percent of Alternative 5 and 63 percent of Alternative 6. The slopes in the rehabilitation sections will be evaluated on a site-by-site basis with the cooperating agencies to determine where it is feasible to repair the slopes.

Project Objective VII. Avoid, Minimize, or Mitigate Adverse Impacts to the Environment by Considering Key Issues Identified through the Public and Agency Involvement Process: While Alternative 1 would create no new adverse impacts to the environment, it would perpetuate the existing problems of dust, erosion, and sedimentation from the existing road surface and cutslopes. Alternative 1 would also contribute to environmental degradation of the area by permitting dispersed recreation and overuse in sensitive areas. The build alternatives would to some degree control dispersed recreation and limit use by formalizing parking areas and creating barriers to prevent parking in sensitive areas.

For the build alternatives, avoiding or minimizing adverse impacts to the environment is a difficult task given that efforts done to avoid or minimize one environmental impact often creates another environmental impact elsewhere or it undermines the ability to meet the other needs for the project. For example, a portion of the existing road traverses riparian areas adjacent to South Clear Creek that probably were wetlands historically. A proposal to reroute the road out of the riparian and wetland areas was proposed but later dismissed because the new alignment would impact old growth forest.

Compared to the other build alternatives, Alternative 6 best addresses the key issues identified during the public and agency involvement process while at the same time addressing and balancing the other needs for the project. These key issues include the following: social environment, water resources, visual quality, recreational resources, plants and animals, and construction impacts. Compared to the other build alternatives, Alternative 6 has the least amount of full reconstruction and the greatest amount of rehabilitation. Though less work can be done to repair drainage and unvegetated slopes in rehabilitation sections, the benefit of performing rehabilitation is that it causes no new disturbance outside of the existing road prism. Because the design of Alternative 6 is based on classification of Guanella Pass Road as a rural

local road, the slower design speeds and shorter design vehicle allow Alternative 6 to most closely follow the existing footprint of the road. The reduced design also minimizes the need for cuts, fills, and retaining walls. While this reduced design will place additional burdens on the land management agencies to monitor and limit vehicle size as well as land use, the benefit of this reduced design is that it results in the least amount of direct impacts to species habitat and wetlands compared to any of the other alternatives. The appearance of Leavenworth Mountain, which is traversed by switchbacks and serves as the historical backdrop for Georgetown, remains visually similar. The minimal design of Alternative 6 also results in decreasing possible indirect impacts such as animal-vehicle conflicts and increased recreational use of the area. Of all of the build alternatives, Alternative 6 has the least amount of impacts to the natural and social environment while at the same time addressing and balancing the other needs for the project.

With respect to construction impacts, the FHWA has identified a number of measures that it will implement to minimize impacts resulting from construction activities. Material sources to provide aggregate for any of the build alternatives were identified along Guanella Pass Road. Use of these on-site material sources reduces the number of truck trips needed to travel through the communities of Grant and Georgetown by almost half compared to using an off-site materials source. Alternative 6 requires the least amount of truck trips of any of the build alternatives. A staging and batch plant site has also been identified along Guanella Pass Road to minimize disruption of the communities by construction hauling activities. A new bridge will be built in Georgetown to accommodate the construction traffic and roads in Georgetown that are impacted by construction hauling will be milled and resurfaced. Hauling schedules will be closely coordinated with the local communities and businesses.

Project Objective VIII. Maintain the Rural and Scenic Character of the Road: Maintaining the scenic and rural character of the road must be balanced with efforts to minimize impacts to the environment and with other needs for the project. For example, laying back slopes and hardening the road surface, as proposed in Alternative 2, maximizes success for revegetation, reduces to the greatest extent possible sedimentation into streams and vegetation communities, and minimizes the projected maintenance costs. However, such measures would alter the appearance and character of the road so that it may appear more like a parkway rather than a rustic road. Conversely, if gravel is used in the attempt to maintain the rustic backcountry nature of the road as proposed in Alternative 3, or the slopes are not laid back to preserve the intimate “closed-in” feel of the road, as proposed to some degree in Alternatives 4, 5, and 6 then sedimentation resulting from the steep unvegetated cutslopes and the road persists as does the high cost of maintenance. Alternative 6, with 63 percent rehabilitation and 37 percent reconstruction best balances all of the needs of the project while also maintaining the rural and scenic character of the road.

With respect to surface type, in order to maintain the rustic appearance of the road while addressing the other needs, Alternative 6 uses macadam along 30 percent of the road, and another 14 percent of the road remains gravel. Macadam is a surface type more durable than gravel but, because of its coarse surface, appears more rustic and provides a rougher ride than pavement.

Selection of Preferred Alternative Surface Type: The existing surface types along Guanella Pass Road consist of 48 percent pavement and 52 percent gravel/dirt. Under Alternative 6, at the request of the road-maintaining agency (Park County), an additional eight percent of the existing gravel/dirt portion (Shelf Road area) will be paved with a chip seal. For the remaining

gravel/dirt portions of the road, the Counties and the FS requested that the FHWA consider using a more stabilized surface type that would help reduce maintenance costs and reduce sedimentation into streams. Five alternative surface types were considered for the gravel/dirt sections, including magnesium chloride/PennzSuppress D, macadam, Road Oyl, Permazyme, and recycled asphalt. Asphalt pavement with a chip seal was also considered as an alternative surface type to plain asphalt pavement. Based on comments received on the 100-meter test strips constructed on Guanella Pass Road, research performed on maintenance requirements of the alternative surface types, input from the land management and road maintaining agencies, and concerns regarding the need to preserve the rustic appearance of the road, asphalt pavement with a chip seal was selected for the asphalt portions of Alternative 6, and a combination of macadam and gravel with magnesium chloride was selected for the gravel/dirt portions of the road. The asphalt pavement with a chip seal provides a more rustic appearance than just asphalt pavement and will be used on approximately 56 percent of the road.

Macadam will be used on portions of the road that are currently gravel/dirt that are either adjacent to streams or are in steep areas that quickly lose unstabilized gravel, except in the Shelf Road area as noted above and in six segments from approximately Station 19+140 to Station 22+450 which will have asphalt pavement with a chip seal surface. Although macadam is a hardened surface that uses an asphalt binder, it appears more rustic than pavement because of the coarser materials and method of construction. It also provides a rougher ride. Macadam requires less maintenance than any of the other alternative surface types for the gravel/dirt sections, and produces little sedimentation. Macadam is proposed for 30 percent of the project and, for the portions of the road where it will be used, it best balances the reduction of sedimentation with preserving the rustic and scenic character of the road and the other needs of the project. Pavement with a chip seal is proposed for another 56 percent. Gravel with magnesium chloride will be used for the remaining 14 percent of the road that is currently gravel and is relatively flat or distant from streams. In these sections of the road, gravel best balances the rustic character of the road with the other needs of the project, although it does require a high level of maintenance effort.

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